

(10) Patent No.: US 6,618,469 B2  
(45) Date of Patent: Sep. 9, 2003

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*Primary Examiner*—Rexford Barnie

(74) *Attorney, Agent, or Firm*—Fogg and Associates, LLC;  
Scott V. Lundberg

(57) **ABSTRACT**

Circuits for testing POTS service on a shared POTS/xDSL carrier include microfilters for selective coupling to the subscriber loop side of an xDSL filter associated with a subscriber line interface circuit. Such configurations facilitate testing of the POTS service using an insertion point that is between the xDSL filter and the subscriber loop in a manner that is transparent to subscribers.

**30 Claims, 5 Drawing Sheets**

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US006617941B2

(12) **United States Patent**  
**Heumann**

(10) **Patent No.:** **US 6,617,941 B2**  
(45) **Date of Patent:** **Sep. 9, 2003**

(54) **METHOD FOR DESIGNING A FILTER SYSTEM**

(58) **Field of Search** ..... 333/167, 172,  
333/175, 177, 181, 185; 307/105

(75) **Inventor:** Dirk Heumann, Nidderau (DE)

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(73) **Assignee:** Vacuumschmelze GmbH & Co. KG,  
Hanau (DE)

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(\*) **Notice:** Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days.

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(21) **Appl. No.:** 09/913,699

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(51) **Int. Cl.<sup>7</sup>** ..... H03H 7/09; H03H 7/06

(52) **U.S. Cl.** ..... 333/167; 333/172

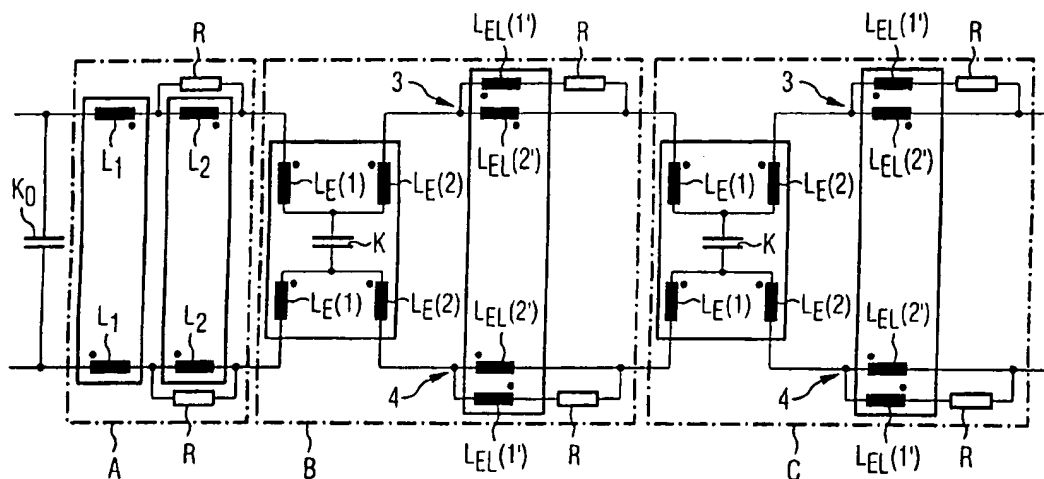
*Primary Examiner*—Seungsook Ham

(74) *Attorney, Agent, or Firm*—Dean W. Russell; Kilpatrick  
Stockton LLP

(57) **ABSTRACT**

A filter system includes at least two longitudinal branches with longitudinal inductors and at least one filter section (B) and an adjacent filter section (A). The filter section (B) is provided with at least one transverse branch that is interposed between the longitudinal branches, the adjacent filter section (A) adjoining the transverse branch. The number of inductors of a filter section that are wound around different magnet cores can be reduced by equivalence transformation.

25 Claims, 8 Drawing Sheets





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(12) **United States Patent**  
**Chueh et al.**

(10) **Patent No.:** **US 6,552,630 B2**  
**(45) Date of Patent:** **Apr. 22, 2003**

(54) **BI-DIRECTIONAL LOW-PASS FILTER FOR  
 USE AT USER END OR OFFICE END IN  
 COMMUNICATION NETWORK**

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(75) **Inventors:** **Her-Jun Chueh, Taipei (TW);  
 Kuang-Che Chen, Taipei (TW)**

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(73) **Assignee:** **Primax Electronics Ltd., Taipei (TW)**

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(21) **Appl. No.:** **09/997,700**

*Primary Examiner*—Seungsook Ham

(22) **Filed:** **Nov. 29, 2001**

(74) *Attorney, Agent, or Firm*—Mathews, Collins,  
 Shepherd & McKay, P.A.

(65) **Prior Publication Data**

(57) **ABSTRACT**

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(51) **Int. Cl.<sup>7</sup>** ..... **H03H 7/06**

(52) **U.S. Cl.** ..... **333/172; 333/177; 333/181;  
 379/399.01**

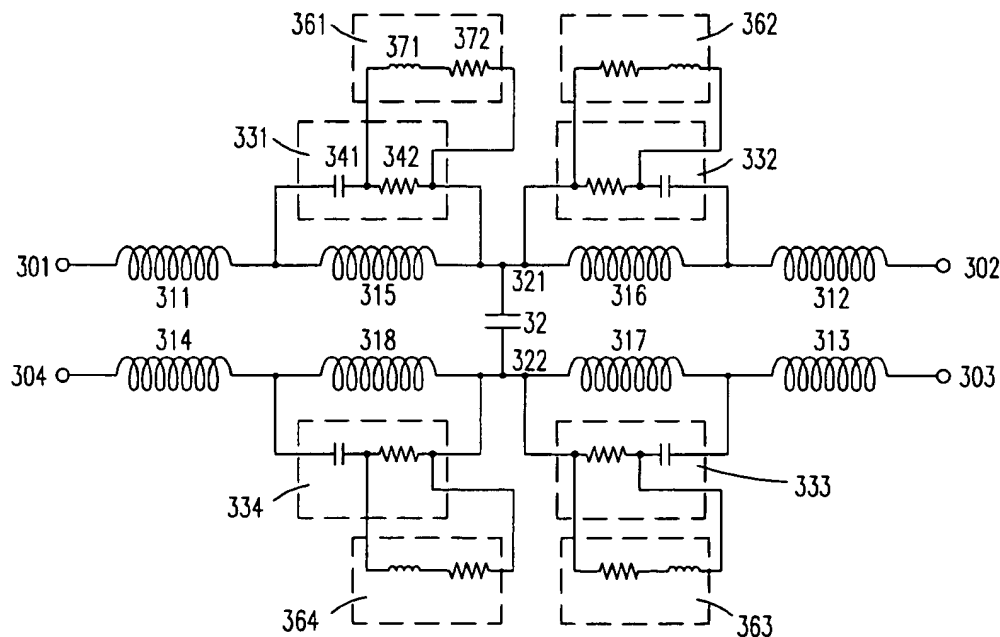
(58) **Field of Search** ..... **333/172, 175,  
 333/176, 177, 181, 185; 379/399.01, 398**

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**9 Claims, 5 Drawing Sheets**





US006285754B1

(12) **United States Patent**  
**Sun et al.**

(10) **Patent No.:** **US 6,285,754 B1**  
(45) **Date of Patent:** **\*Sep. 4, 2001**

(54) **ODD-ORDER LOW-PASS POTS DEVICE  
MICROFILTER**

(75) **Inventors:** **Ting Sun, Houston, TX (US); Brian L.  
Hinman, Los Gatos, CA (US)**

(73) **Assignee:** **2Wire, Inc., San Jose, CA (US)**

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*Primary Examiner*—Forester W. Isen

*Assistant Examiner*—Ramnandan Singh

(74) *Attorney, Agent, or Firm*—Carr & Ferrell LLP

#### (57) ABSTRACT

An odd-order low-pass microfilter is disclosed for being interposed between a home telephone wiring network and a POTS, or voice-band, device to separate voice-band signals from higher frequency signals, such as ADSL signals and home networking signals. The filter topology is substantially symmetric so that the filter is reversible in that either end of the filter may be directly coupled to the home telephone wiring network without impairing high frequency signal performance or the filter characteristic of the filter. In one embodiment, the filter is a three-pole filter with a single capacitor disposed between a pair of coupled inductors. Each of the coupled inductors advantageously has an interwinding capacitance over about 100 pF to improve the filter frequency response without increasing the cost of the filter. In another embodiment, the filter is a reversible three-pole filter with a single capacitor disposed between first and second pairs of uncoupled, or discrete, inductors.

10 Claims, 10 Drawing Sheets

—This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.<sup>7</sup>** ..... **H04M 1/100; H04M 11/06;**  
**H04B 1/38**

(52) **U.S. Cl.** ..... **379/399; 375/220; 375/259;**  
**375/219; 370/494; 370/493; 370/495**

(58) **Field of Search** ..... **379/399, 419,**  
**379/389, 397, 93.07, 93.1; 370/494, 493,**  
**495; 375/220, 259, 219**

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